Defense Information Infrastructure (DII)

Common Operating Environment (COE)

Statement of Functionality (SOF)
for the
JMudd Run-Time (JmuddR) Segment

9 August 1999

Prepared for:

Space and Naval Warfare Systems Command

Environmental Systems Program Office

(SPAWAR PMW-185)

Prepared by:

Fleet Numerical Meteorology and Oceanography Center

Monterey, CA

and

Integrated Performance Decisions, Inc.

Monterey, CA

Table of Contents

List of Figures

1   SCOPE

1.1   Identification

This document describes the functionality of the the JMudd Runtime (JmuddR) segment of the Navy Integrated Tactical Environmental Subsystem (NITES). The JMuddR environment is required for applications developed using the JMudd, which is a programming toolkit for generating Java/C language bindings that allow a Java application to call C functions and access C data types (structures, unions, arrays, etc.).

1.2   System Overview

NITES I acquires and assimilates various METOC data for use by US Navy and Marine Corps weather forecasters and tactical planners. It stores these data and products in the METOC Database. NITES I provides users with METOC data, products, and applications necessary to support the warfighter in tactical operations and decision making. NITES I provides data and products to NITES I and II applications, as well as non-NITES systems requiring METOC data, in a heterogeneous, networked computing environment.

1.3   Document Overview

Section 2 provides a more detailed overview of NITES, while Section 3 contains more detail concerning the specific functionality provided by the JMuddR segment.

2 NITES SYSTEM FUNCTIONALITY

The software described in this document forms a portion of NITES. On 29 October 1996, the Oceanographer of the Navy issued a Program Policy statement in letter 3140 Serial 961/6U570953, modifying the Program by calling for five seamless software versions that are DII COE compliant, preferably to level 5.

The five versions are:

- NITES Version I   The local data fusion center and principal METOC analysis and forecast system

- NITES Version II   The subsystem on the Joint Maritime Command Information System (JMCIS) or Global Command and Control System (GCCS) (NITES/Joint METOC Segment (JMS))

- NITES Version III   The unclassified aviation forecast, briefing, and display subsystem tailored to Naval METOC shore activities (currently satisfied by the Meteorological Integrated Data Display System (MIDDS))

- NITES Version IV   The Portable subsystem composed of independent Personal Computers (PCs)/workstations and modules for forecaster, satellite, communications, and Integrated Command, Control, Communications, Computer, and Intelligence Surveillance Reconnaissance (IC4ISR) functions (currently the Interim Mobile Oceanographic Support System (IMOSS))

- NITES Version V   Foreign Military Sales (currently satisfied by the Allied Environmental Support System (AESS))

NITES I acquires and assimilates various METOC data for use by US Navy and Marine Corps weather forecasters and tactical planners. NITES I provides these users with METOC data, products, and applications necessary to support the warfighter in tactical operations and decision making. NITES I provides METOC data and products to NITES I and II applications, as well as other systems requiring METOC data, in a heterogeneous, networked computing environment.

3   JMUDDR SEGMENT FUNCTIONALITY

The JMudd Runtime environment is required for applications developed using the JMudd. JMudd is a programming toolkit for generating Java/C language bindings that allow a Java application to call C functions and access C data types (structures, unions, arrays, etc.). At runtime, data is marshalled between Java and C using the Java Native Interface (JNI). The JNI is distributed by Sun Microsystems as part of the Java Development Kit (JDK), since release 1.1 of the JDK.

The JMudd Runtime Segment is primarily composed of two software components: the Java archive jmudd.jar and the Dynamic Link Library (or shared library, as appropriate) jmudd.dll (or jmudd.sl). The jmudd.jar Java archive provides a set of supporting Java classes for use in conjunction with the Jmudd generated Java/C bindings. The jmudd.dll dynamic link library provides a set of convenience routines used in the JMudd-generated JNI code stubs that are used to marshal data between Java and C language data types. Figure 3-1 below illustrates how the JMudd-generated Java/C bindings can be used to develop remote or local Java applications or Applets.
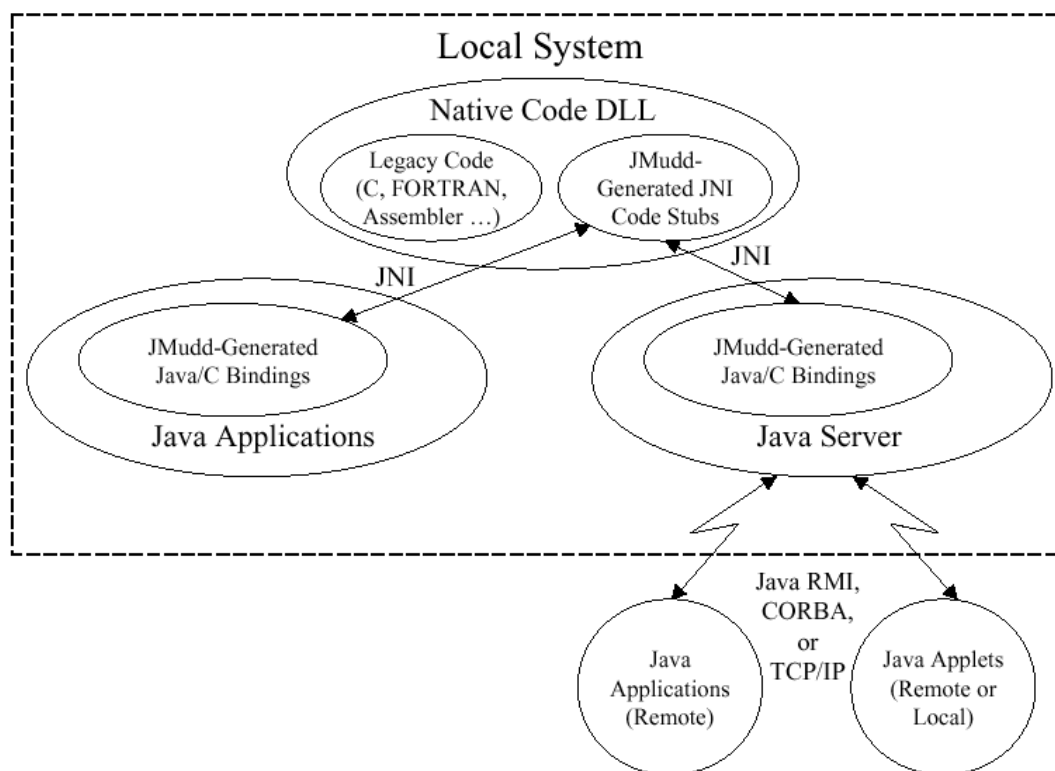
Figure 3-1. Development of Remote or Local Java Applications or Applets From Jmudd-Generated Java/C Bindings